

## COMBINED INTERFERENCE CANCELLATION WITH FEC DECODING FOR HIGH SPECTRAL EFFICIENCY SATELLITE COMMUNICATIONS

### ABSTRACT OF THE DISCLOSURE

[0049] A combined interference cancellation communication system employing forward error code (FEC) decoding for high spectral efficiency satellite communications. The disclosed system enables efficient utilization of available bandwidth through overlapping adjacent channels. A receiver is used to receive a waveform having data information and noise information. A filter bank is coupled with the receiver to receive and filter waveform and output channel information received by the receiver. The channel information received includes a combination of data signals and adjacent channel interference signals. A demodulator is provided to provide an estimation signal representative of an estimation of at least one parameter of the channel information. Soft-input and soft-output decoders are provided to receive the channel information in order to calculate and estimate interference values based on the estimation signal. Additionally, the soft-input and soft-output interference canceler is provided for receiving the output channel information and the estimated interference value calculated from the decoders in order to provide a data signal based on substantially without interference the channel information and estimated interference value. Thus, a substantially more accurate data signal is provided. Typically, such systems employ remote ground terminals, e.g., VSAT, which are used for communicating via a geosynchronous satellite from a remote location to a central hub station or other remote locations. A particular advantage of the disclosed systems is their relatively low site cost and small earth station size.